CIVIL AIM CONSULTANTS & ENGINEERS

(Building Geo-Tech & Highway Materials Testing Laboratory)

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JobNo: ~~CACE/BBMP/NK/W No.14/2022-2023~~ Date : ~~15.07.2022~~

TEST RESULTS OF AGGREGATE IMPACT VALUE

Client :Assistant Executive Engineer, T Dasarahalli Sub Division, BBMP, Bangalore.

Agency : Sri. Nagaraja K, Contractor, Bangalore.

Name of work : De-Siliting and Re-Setting of Drain and Re-Asphalting to 8th B Cross 9th Cross 15th 18th Main and Other Cross Roads in Ward No 14 Bagalagunte.

Source / Location : Hot Mix Plant, Bangalore

BIS Code : IS 2386 Part (4):1963

Type of Mix : Dense Graded Bituminous Macadam

Date of test : 15.07.2022

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W1 g	383	385	
2	Weight of agregate passing 2.36 mm sieve after the test = W2 g	87	89	
3	Weight of aggregate retained 2.36 mm sieve after the test = W3 g	296	296	
5	Aggregate Impact value = percent fines 100* (W2/W1) percent	22.72	23.12	**22.92**

Comments:

→ Maximum allowable Aggregate Impact value for Dense Graded Bituminous Macadam is 27% (Table 500-8 of MORTH specification)

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ಟಿ. ದಾಸರಹಳ್ಳಿ ಉಪ ವಿಭಾಗ
ಬಾಗಲಗುಂಟೆ. ಪಶ್ಚಿಮ ವಲಯ
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For CIVIL AIM CONSULTANTS & ENGINEERS

Authorised Signatory

No. 01, Satvika Nilaya, Opp. Widia Poorna Prajna School,
Ramaiah Layout, Nagasandra, Bangalore - 560 073.
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JobNo: CACE/BBMP/NK/W No.14/2022-2023 Date : 15.07.2022

TEST RESULTS OF AGGREGATE SHAPE TEST
(Flakiness & Elongation)

Client :Assistant Executive Engineer, T Dasarahalli Sub Division, BBMP, Bangalore.

Agency : Sri. Nagaraja K, Contractor, Bangalore.

Name of work : De-Siliting and Re-Setting of Drain and Re-Asphalting to 8th B Cross 9th Cross 15th 18th Main and Other Cross Roads in Ward No 14 Bagalagunte.

BIS Code : IS 2386 Part (1):1963

Date of Test : 15.07.2022

Type of Mix : Dense Graded Bituminous Macadam

Sl.No.	Flakiness Index Value(%)	Elongation Index Value(%)	Total(Combined Flakiness and Elongation)(%)	Requirements
1	12.30	13.61	25.91	Maximum allowable Combined Flakiness and Elongation Indices for Dense Graded Bituminous Macadam is 35% as per Table 500.8 MORTH Specification.
2	12.50	13.80	26.30	

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Job No: CACE/BBMP/NK/W No.14/2022-2023 Date: **15.07.2022**

TEST REPORT ON PAVING BITUMEN

Client	:Assistant Executive Engineer, T Dasarahalli Sub Division, BBMP, Bangalore.
Agency	: Sri. Nagaraja K, Contractor, Bangalore.
Name of work	: De-Siliting and Re-Setting of Drain and Re-Asphalting to 8th B Cross 9th Cross 15th 18th Main and Other Cross Roads in Ward No 14 Bagalagunte.
BIS Code	IS 73:2013,IS 1203:1978, IS 1208:1978, IS 1205:1978, IS1448(P-69):1969
Date of Testing	**15.07.2022**
Type of Mix	**Dense Graded Bituminous Macadam , VG 30**
Source of Location	**Hot Mix Plant**

The results of the tests conducted on the bitumen sample using for Dense Graded Bituminous Macadam

Sl.No	Description	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 0C, 100gms, 5sec, 1/10 mm	51	Min 45
2	Softening point, 0C	49	Min 47
3	Ductility at 250C, cm	>100	Min40
4	Flash Point, 0C	281	Min 220

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Job No.: CACE/BBMP/NK/W No.14/2022-2023 Date: 20.07.2022

TEST REPORT ON STABILITY OF MIX

Client	:	:Assistant Executive Engineer, T Dasarahalli Sub Division, BBMP, Bangalore.
Agency	:	: Sri. Nagaraja K, Contractor, Bangalore.
Name of the Work	:	: De-Siliting and Re-Setting of Drain and Re-Asphalting to 8th B Cross 9th Cross 15th 18th Main and Other Cross Roads in Ward No 14 Bagalagunte.
Type of Mix	:	Dense Graded Bituminous Macadam
Date of Testing	:	20.07.2022

The results of the tests conducted on the Dense Graded Bituminous Macadam mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	9.36	10.15	9 Kn (min)
2	Marshal flow, mm	3.71	3.92	2 – 4
3	Percent air voids in Mineral Aggregate	13.81	14.53	13 – 15
4	Voids in Compacted Mix	3.81	4.62	3 – 6
5	Percent Voids filled with Bitumen	68.98	69.52	65 - 75
6	Density, g/cc	2.24	2.23	--

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Job No.: CACE/BBMP/NK/W No.14/2022-2023 Date: 20.07.2022

TEST REPORT ON STABILITY OF MIX

Client	:	:Assistant Executive Engineer, T Dasarahalli Sub Division, BBMP, Bangalore.
Agency	:	: Sri. Nagaraja K, Contractor, Bangalore.
Name of the Work	:	: De-Siliting and Re-Setting of Drain and Re-Asphalting to 8th B Cross 9th Cross 15th 18th Main and Other Cross Roads in Ward No 14 Bagalagunte.
Type of Mix	:	Dense Graded Bituminous Macadam
Date of Testing	:	20.07.2022

The results of the tests conducted on the Dense Graded Bituminous Macadam mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	9.32	10.11	9 Kn (min)
2	Marshal flow, mm	3.72	3.81	2 – 4
3	Percent air voids in Mineral Aggregate	13.72	14.3	13 – 15
4	Voids in Compacted Mix	3.82	4.25	3 – 6
5	Percent Voids filled with Bitumen	68.92	69.55	65 - 75
6	Density, g/cc	2.22	2.25	--

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Job No.: CACE/BBMP/NK/W No.14/2022-2023 Date: 20.07.2022

BITUMEN CONTENT AND GRADATION DETERMINATION OF DENSE GRADED BITUMINOUS MACADAM MIX

AASHTO T 164 & AASHTO T 30

Client	**:Assistant Executive Engineer, T Dasarahalli Sub Division, BBMP, Bangalore.**
Agency	**: Sri. Nagaraja K, Contractor, Bangalore.**
Name of the Work	: De-Siliting and Re-Setting of Drain and Re-Asphalting to 8th B Cross 9th Cross 15th 18th Main and Other Cross Roads in Ward No 14 Bagalagunte.
Date of Testing	20.07.2022

BITUMEN CONTENT DETERMINATION

Description	Test 1	Test 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	476.5	477
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	23.50	23.00
7. Bitumen content in %	4.70	4.60
8. Average	**4.65**	

GRADATION AFTER EXTRACTION

SIEVE SIZE	Test 1				Requirement as per MORTH table 500.10
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
37.5	0	0	0	100	100
26.5	36.2	36.2	7.6	92.4	90 - 100
19	72.5	108.7	22.8	77.2	71 - 95
13.2	65.2	173.9	36.5	63.5	56 - 80
4.75	83.2	257.1	54.0	46.0	38 - 54
2.360	75.2	332.3	69.7	30.3	28 - 42
0.300	96.1	428.4	89.9	10.1	7 - 21
0.075	21.9	450.3	94.5	5.5	2 - 8

SIEVE SIZE	Test 2				Requirement as per MORTH table 500.10
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
37.5	0	0	0	100	100
26.5	36.6	36.6	7.7	92.3	90 - 100
19	73.2	109.8	23.0	77.0	71 - 95
13.2	66.1	175.9	36.9	63.1	56 - 80
4.75	84.40	260.3	54.6	45.4	38 - 54
2.360	78.8	339.1	71.1	28.9	28 - 42
0.300	98.8	437.9	91.8	8.2	7 - 21
0.075	23.1	461	96.6	3.4	2 - 8

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BITUMEN CONTENT AND GRADATION DETERMINATION OF DENSE GRADED BITUMINOUS MACADAM MIX

AASHTO T 164 & AASHTO T 30

Client	:Assistant Executive Engineer, T Dasarahalli Sub Division, BBMP, Bangalore.
Agency	: Sri. Nagaraja K, Contractor, Bangalore.
Name of the Work	: De-Siliting and Re-Setting of Drain and Re-Asphalting to 8th B Cross 9th Cross 15th 18th Main and Other Cross Roads in Ward No 14 Bagalagunte.
Date of Testing	20.07.2022

BITUMEN CONTENT DETERMINATION

Description	Test 1	Test 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	477.5	477
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	22.50	23.00
7. Bitumen content in %	4.50	4.60
8. Average	4.55	

GRADATION AFTER EXTRACTION

SIEVE SIZE	Test 1				Requirement as per MORTH table 500.10
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
37.5	0	0	0	100	100
26.5	34.4	34.4	7.2	92.8	90 - 100
19	74.9	109.3	22.9	77.1	71 - 95
13.2	66.9	176.2	36.9	63.1	56 - 80
4.75	84.6	260.8	54.6	45.4	38 - 54
2.360	76.5	337.3	70.6	29.4	28 - 42
0.300	96.9	434.2	90.9	9.1	7 - 21
0.075	21.9	456.1	95.5	4.5	2 - 8

SIEVE SIZE	Test 2				Requirement as per MORTH table 500.10
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
37.5	0	0	0	100	100
26.5	36.5	36.5	7.7	92.3	90 - 100
19	73.4	109.9	23.0	77.0	71 - 95
13.2	66.8	176.7	37.0	63.0	56 - 80
4.75	84.50	261.2	54.8	45.2	38 - 54
2.360	78.6	339.8	71.2	28.8	28 - 42
0.300	98.5	438.3	91.9	8.1	7 - 21
0.075	23.4	461.7	96.8	3.2	2 - 8

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Job No.: CACE/BBMP/NK/W No.14/2022-2023 Date: 22.07.2022

Aggregate Impact Value

Client	**:Assistant Executive Engineer, T Dasarahalli Sub Division, BBMP, Bangalore.**
Agency	**: Sri. Nagaraja K, Contractor, Bangalore.**
Name of the Work	: De-Siliting and Re-Setting of Drain and Re-Asphalting to 8th B Cross 9th Cross 15th 18th Main and Other Cross Roads in Ward No 14 Bagalagunte.
BIS Code	IS 2386(Part 4):1963
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	22.07.2022

Sl No.	Details	Test No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	382	383	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	85	85.5	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	297	297.5	
4	Aggregate Impact value = percent fines 100* (W_2/W_1) percent	22.25	22.32	**22.29**

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%(MORTH table no.500.16)

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Aggregate Gradation Test

IS : 2386 Part I

Client	**:Assistant Executive Engineer, T Dasarahalli Sub Division, BBMP, Bangalore.**
Agency	**: Sri. Nagaraja K, Contractor, Bangalore.**
Name of the Work	: De-Siliting and Re-Setting of Drain and Re-Asphalting to 8th B Cross 9th Cross 15th 18th Main and Other Cross Roads in Ward No 14 Bagalagunte.
BIS Code	IS 2386(Part 1):1963
Sample I / D	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	22.07.2022

Total Weight of Sample: **5000** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Requirement as per MORTH table 500.17	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH
13.2	415	8.30	8.30	91.70	90 - 100	
9.5	482	9.64	17.94	82.06	70 - 88	
4.75	635	12.70	30.64	69.36	53 - 71	
2.36	682	13.64	44.28	55.72	42 - 58	
1.18	520	10.40	54.68	45.32	34 - 48	
0.600	546	10.92	65.60	34.40	26 - 38	
0.300	489	9.78	75.38	24.62	18 - 28	
0.150	366	7.32	82.70	17.30	12 - 20	
0.075	482	9.64	92.34	7.66	4 - 10	

Total Weight of Sample: **5000** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Requirement as per MORTH table 500.17	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH
13.2	420	8.40	8.40	91.60	90 - 100	
9.5	549	10.98	19.38	80.62	70 - 88	
4.75	682	13.64	33.02	66.98	53 - 71	
2.36	533	10.66	43.68	56.32	42 - 58	
1.18	559	11.18	54.86	45.14	34 - 48	
0.600	546	10.92	65.78	34.22	26 - 38	
0.300	682	13.64	79.42	20.58	18 - 28	
0.150	198	3.96	83.38	16.62	12 - 20	
0.075	482	9.64	93.02	6.98	4 - 10	

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Job No.: CACE/BBMP/NK/W No.14/2022-2023 Date : 22.07.2022

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	**:Assistant Executive Engineer, T Dasarahalli Sub Division, BBMP, Bangalore.**
Agency	**: Sri. Nagaraja K, Contractor, Bangalore.**
Name of Work	: De-Siliting and Re-Setting of Drain and Re-Asphalting to 8th B Cross 9th Cross 15th 18th Main and Other Cross Roads in Ward No 14 Bagalagunte.
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Bituminous Concrete
Date of Testing	22.07.2022

Sl no	Test	1	2	Requirements as per MORTH 5th edition table no 500.16
1	Flakiness Index	11.6	12.2	Combined Flakiness & Elongation index Max 35%
2	Elongation Index	13.2	13.4	
	Combined Flakiness & Elongation index	24.80	25.60	

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ಟಿ. ದಾಸರಹಳ್ಳಿ ಉಪ ವಿಭಾಗ
ಬಾಗಲಗುಂಟೆ, ಜಿ.ಕ್ಷ.ಎಂ.ಪಿ
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For CIVIL AIM CONSULTANTS & ENGINEERS

Authorised Signatory

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Job No.: CACE/BBMP/NK/W No.14/2022-2023 Date : 24.07.2022

Specific Gravity And Water Absorption Test

Client	**:Assistant Executive Engineer, T Dasarahalli Sub Division, BBMP, Bangalore.**
Agency	**: Sri. Nagaraja K, Contractor, Bangalore.**
Name of the Work	: De-Siliting and Re-Setting of Drain and Re-Asphalting to 8th B Cross 9th Cross 15th 18th Main and Other Cross Roads in Ward No 14 Bagalagunte.
BIS Code	IS 2386(Part 3):1963
Type of Mix	Bituminous Concrete
Date of Testing	22.07.2022 to 24.07.2022

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2020	2022	2024	
2	Weight of basket suspended in water	W_2 g	755	755	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1265	1267	1269	
4	Weight of saturated surface dry aggregate in air	W_3 g	2016	2018	2020	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	751	751	751	
6	Weight of oven dried aggregate	W_4 g	2010	2011	2012	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.676	2.678	2.679	2.678
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.698	2.703	2.708	2.703
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.30%	0.35%	0.40%	0.35%

Comments:

→ Maximum allowable Aggregate Water absorption value for Bituminous Concrete is 2.0%(MORTH table 500.16)

Note:

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Job No.: CACE/BBMP/NK/W No.14/2022-2023 Date: 22.07.2022

TEST REPORT

Client	:	:Assistant Executive Engineer, T Dasarahalli Sub Division, BBMP, Bangalore.
Agency	:	: Sri. Nagaraja K, Contractor, Bangalore.
Name of the work	:	: De-Siliting and Re-Setting of Drain and Re-Asphalting to 8th B Cross 9th Cross 15th 18th Main and Other Cross Roads in Ward No 14 Bagalagunte.
IS Code	:	IS 73:2013, IS 1203:1978(RA 2008), IS 1205:1978(RA 2009), IS 1208:1978(RA 2009), IS 1209:1978(RA 2009)
Source of location	:	Hot mix Plant, Bangalore, VG 30
Date of testing	:	22.07.2022

The results of the tests conducted on the bitumen sample using for Bituminous Concrete

Sl. No	Description	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 ^{0}C, 1/10 mm	48	Min 45
2	Softening point, ^{0}C	54	Min. 47
3	Ductility at 27^{0}C, cm	> 100	Min. 40
4	Flash Point, ^{0}C	272	Min. 220

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Job No.: CACE/BBMP/NK/W No.14/2022-2023 Date: 28.07.2022

TEST REPORT ON STABILITY OF MIX

Client	:	:Assistant Executive Engineer, T Dasarahalli Sub Division, BBMP, Bangalore.
Agency	:	: Sri. Nagaraja K, Contractor, Bangalore.
Name of the Work	:	: De-Siliting and Re-Setting of Drain and Re-Asphalting to 8th B Cross 9th Cross 15th 18th Main and Other Cross Roads in Ward No 14 Bagalagunte.
Source of location	:	Hot mix Plant, Bangalore
Type of Mix	:	Bituminous Concrete
Date of Testing	:	28.07.2022

The results of the tests conducted on the Bituminous Concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	9.48	9.95	9 Kn (min)
2	Marshal flow, mm	3.12	2.97	2 – 4
3	Percent air voids in Mineral Aggregate	13.22	14.35	13 – 15
4	Voids in Compacted Mix	3.63	4.66	3 – 6
5	Percent Voids filled with Bitumen	69.29	68.25	65 - 75
6	Density, g/cc	2.25	2.25	--

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Job No.: CACE/BBMP/NK/W No.14/2022-2023 Date: 28.07.2022

TEST REPORT ON STABILITY OF MIX

Client	:	:Assistant Executive Engineer, T Dasarahalli Sub Division, BBMP, Bangalore.
Agency	:	: Sri. Nagaraja K, Contractor, Bangalore.
Name of the Work	:	: De-Siliting and Re-Setting of Drain and Re-Asphalting to 8th B Cross 9th Cross 15th 18th Main and Other Cross Roads in Ward No 14 Bagalagunte.
Source of location	:	Hot mix Plant, Bangalore
Type of Mix	:	Bituminous Concrete
Date of Testing	:	28.07.2022

The results of the tests conducted on the Bituminous Concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	9.67	9.54	9 Kn (min)
2	Marshal flow, mm	3.46	2.58	2 – 4
3	Percent air voids in Mineral Aggregate	13.78	14.45	13 – 15
4	Voids in Compacted Mix	3.12	4.52	3 – 6
5	Percent Voids filled with Bitumen	70.25	71.61	65 - 75
6	Density, g/cc	2.21	2.23	--

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Job No.: CACE/BBMP/NK/W No.14/2022-2023 Date: 28.07.2022

TEST REPORT ON STABILITY OF MIX

Client	:	:Assistant Executive Engineer, T Dasarahalli Sub Division, BBMP, Bangalore.
Agency	:	: Sri. Nagaraja K, Contractor, Bangalore.
Name of the Work	:	: De-Siliting and Re-Setting of Drain and Re-Asphalting to 8th B Cross 9th Cross 15th 18th Main and Other Cross Roads in Ward No 14 Bagalagunte.
Source of location	:	Hot mix Plant, Bangalore
Type of Mix	:	Bituminous Concrete
Date of Testing	:	28.07.2022

The results of the tests conducted on the Bituminous Concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	9.75	10.15	9 Kn (min)
2	Marshal flow, mm	3.25	3.5	2 – 4
3	Percent air voids in Mineral Aggregate	14.1	14.25	13 – 15
4	Voids in Compacted Mix	4.1	4.12	3 – 6
5	Percent Voids filled with Bitumen	67.29	69.12	65 - 75
6	Density, g/cc	2.21	2.24	--

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Job No.: CACE/BBMP/NK/W No.14/2022-2023 Date: 28.07.2022

TEST REPORT ON STABILITY OF MIX

Client	:	:Assistant Executive Engineer, T Dasarahalli Sub Division, BBMP, Bangalore.
Agency	:	: Sri. Nagaraja K, Contractor, Bangalore.
Name of the Work	:	: De-Siliting and Re-Setting of Drain and Re-Asphalting to 8th B Cross 9th Cross 15th 18th Main and Other Cross Roads in Ward No 14 Bagalagunte.
Source of location	:	Hot mix Plant, Bangalore
Type of Mix	:	Bituminous Concrete
Date of Testing	:	28.07.2022

The results of the tests conducted on the Bituminous Concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	10.25	9.58	9 Kn (min)
2	Marshal flow, mm	3.67	2.45	2 – 4
3	Percent air voids in Mineral Aggregate	13.46	14.52	13 – 15
4	Voids in Compacted Mix	3.78	4.61	3 – 6
5	Percent Voids filled with Bitumen	70.12	71.15	65 - 75
6	Density, g/cc	2.25	2.26	--

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Job No.: CACE/BBMP/NK/W No.14/2022-2023 Date : 28.07.2022

BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE

AASHTO T 164 & AASHTO T 30

CLIENT	:Assistant Executive Engineer, T Dasarahalli Sub Division, BBMP, Bangalore.
AGENCY	: Sri. Nagaraja K, Contractor, Bangalore.
NAME OF THE WORK	: De-Siliting and Re-Setting of Drain and Re-Asphalting to 8th B Cross 9th Cross 15th 18th Main and Other Cross Roads in Ward No 14 Bagalagunte.
SAMPLE ID	Hot Mix Plant, Bangalore
DATE OF TESTING	28.07.2022

BITUMEN CONTENT DETERMINATION

Description	Sample 1	Sample 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	470.5	469
3. Weight of Asphalt and Mineral matter Extracted, g	29.5	31
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g	-	-
6. Weight of Bitumen Extracted, g. (corrected)	29.5	31
7. Bitumen content in %	5.90	6.20
8. Average	6.05	

GRADATION AFTER EXTRACTION

SIEVE SIZE mm	Test 1 Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	Requirement as per MORTH table 500.17
19	0	0	0	100	100
13.2	13.1	13.1	2.8	97.2	90 - 100
9.5	69.1	82.2	17.5	82.5	70 - 88
4.75	92.1	174.3	37.0	63.0	53 - 71
2.36	42.2	216.5	46.0	54.0	42 - 58
1.18	37	253.5	53.9	46.1	34 - 48
0.600	51.1	304.6	64.7	35.3	26 - 38
0.300	46.5	351.1	74.6	25.4	18 - 28
0.150	35.1	386.2	82.1	17.9	12 - 20
0.075	47.1	433.3	92.1	7.9	4 - 10

SIEVE SIZE mm	Test 2 Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	Requirement as per MORTH table 500.17
19	0	0	0	100	100
13.2	14.3	14.3	3.0	97.0	90 - 100
9.5	62.5	76.8	16.4	83.6	70 - 88
4.75	91.1	167.9	35.8	64.2	53 - 71
2.36	46.7	214.6	45.8	54.2	42 - 58
1.18	43.5	258.1	55.0	45.0	34 - 48
0.600	52.1	310.2	66.1	33.9	26 - 38
0.300	49.1	359.3	76.6	23.4	18 - 28
0.150	35.2	394.5	84.1	15.9	12 - 20
0.075	40.5	435	92.8	7.2	4 - 10

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For CIVIL AIM CONSULTANTS & ENGINEERS

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Job No.: CACE/BBMP/NK/W No.14/2022-2023 Date : 28.07.2022

BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE

AASHTO T 164 & AASHTO T 30

CLIENT	Assistant Executive Engineer,Maruthisevanagara Sub Division, BBMP, Bangalore.
AGENCY	Sri. M.S.Venkatesh, Contractor, Bangalore..
NAME OF THE WORK	Comprehensive Development of roads and drains in Ward No-27(Package-01), BBMP, Bangalore.
SAMPLE ID	Hot Mix Plant, Bangalore
DATE OF TESTING	28.07.2022

BITUMEN CONTENT DETERMINATION

Description	Sample 1	Sample 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	471	469
3. Weight of Asphalt and Mineral matter Extracted, g	29	31
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g	-	-
6. Weight of Bitumen Extracted, g. (corrected)	29	31
7. Bitumen content in %	5.80	6.20
8. Average	6.00	

GRADATION AFTER EXTRACTION

SIEVE SIZE mm	Test 1 Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	Requirement as per MORTH table 500.17
19	0	0	0	100	100
13.2	14.2	14.2	3.0	97.0	90 - 100
9.5	66.2	80.4	17.1	82.9	70 - 88
4.75	91.3	171.7	36.5	63.5	53 - 71
2.36	45.9	217.6	46.2	53.8	42 - 58
1.18	36.1	253.7	53.9	46.1	34 - 48
0.600	55.9	309.6	65.7	34.3	26 - 38
0.300	43.1	352.7	74.9	25.1	18 - 28
0.150	35.1	387.8	82.3	17.7	12 - 20
0.075	41.5	429.3	91.1	8.9	4 - 10

SIEVE SIZE mm	Test 2 Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	Requirement as per MORTH table 500.17
19	0	0	0	100	100
13.2	14.5	14.5	3.1	96.9	90 - 100
9.5	65.9	80.4	17.1	82.9	70 - 88
4.75	92.5	172.9	36.9	63.1	53 - 71
2.36	45.9	218.8	46.7	53.3	42 - 58
1.18	48.9	267.7	57.1	42.9	34 - 48
0.600	56.9	324.6	69.2	30.8	26 - 38
0.300	47.1	371.7	79.3	20.7	18 - 28
0.150	38.1	409.8	87.4	12.6	12 - 20
0.075	31.5	441.3	94.1	5.9	4 - 10

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BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE

AASHTO T 164 & AASHTO T 30

CLIENT	Assistant Executive Engineer,Maruthisevanagara Sub Division, BBMP, Bangalore.
AGENCY	Sri. M.S.Venkatesh, Contractor, Bangalore..
NAME OF THE WORK	Comprehensive Development of roads and drains in Ward No-27(Package-01), BBMP, Bangalore.
SAMPLE ID	Hot Mix Plant, Bangalore
DATE OF TESTING	28.07.2022

BITUMEN CONTENT DETERMINATION

Description	Sample 1	Sample 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	470	468
3. Weight of Asphalt and Mineral matter Extracted, g	30	32
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g	-	-
6. Weight of Bitumen Extracted, g. (corrected)	30	32
7. Bitumen content in %	6.00	6.40
8. Average	6.20	

GRADATION AFTER EXTRACTION

SIEVE SIZE	Test 1				Requirement as per MORTH table 500.17
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	13.2	13.2	2.8	97.2	90 - 100
9.5	69.1	82.3	17.5	82.5	70 - 88
4.75	92.2	174.5	37.1	62.9	53 - 71
2.36	42.2	216.7	46.1	53.9	42 - 58
1.18	36.6	253.3	53.9	46.1	34 - 48
0.600	50	303.3	64.5	35.5	26 - 38
0.300	46.6	349.9	74.4	25.6	18 - 28
0.150	35.5	385.4	82.0	18.0	12 - 20
0.075	46.5	431.9	91.9	8.1	4 - 10

SIEVE SIZE	Test 2				Requirement as per MORTH table 500.17
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	14.4	14.4	3.1	96.9	90 - 100
9.5	62.2	76.6	16.4	83.6	70 - 88
4.75	89.9	166.5	35.6	64.4	53 - 71
2.36	46.5	213	45.5	54.5	42 - 58
1.18	43.5	256.5	54.8	45.2	34 - 48
0.600	52.2	308.7	66.0	34.0	26 - 38
0.300	49.9	358.6	76.6	23.4	18 - 28
0.150	35.5	394.1	84.2	15.8	12 - 20
0.075	40.2	434.3	92.8	7.2	4 - 10

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CIVIL AIM CONSULTANTS & ENGINEERS

(Building Geo-Tech & Highway Materials Testing Laboratory)

An ISO 9001-2015 Certified Company

NABL Accredited As Per ISO/IEC 17025:2017 Laboratory

Job No.: CACE/BBMP/NK/W No.14/2022-2023 Date : 28.07.2022

BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE

AASHTO T 164 & AASHTO T 30

CLIENT	Assistant Executive Engineer,Maruthisevanagara Sub Division, BBMP, Bangalore.
AGENCY	Sri. M.S.Venkatesh, Contractor, Bangalore..
NAME OF THE WORK	Comprehensive Development of roads and drains in Ward No-27(Package-01), BBMP, Bangalore.
SAMPLE ID	Hot Mix Plant, Bangalore
DATE OF TESTING	28.07.2022

BITUMEN CONTENT DETERMINATION

Description	Sample 1	Sample 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	472.5	466
3. Weight of Asphalt and Mineral matter Extracted, g	27.5	34
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g	-	-
6. Weight of Bitumen Extracted, g. (corrected)	27.5	34
7. Bitumen content in %	5.50	6.80
8. Average	6.15	

GRADATION AFTER EXTRACTION

SIEVE SIZE mm	Test 1 Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	Requirement as per MORTH table 500.17
19	0	0	0	100	100
13.2	14.2	14.2	3.0	97.0	90 - 100
9.5	64.9	79.1	16.7	83.3	70 - 88
4.75	91.3	170.4	36.1	63.9	53 - 71
2.36	48.2	218.6	46.3	53.7	42 - 58
1.18	36.8	255.4	54.1	45.9	34 - 48
0.600	57.6	313	66.2	33.8	26 - 38
0.300	43.3	356.3	75.4	24.6	18 - 28
0.150	35.9	392.2	83.0	17.0	12 - 20
0.075	40.1	432.3	91.5	8.5	4 - 10

SIEVE SIZE mm	Test 2 Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	Requirement as per MORTH table 500.17
19	0	0	0	100	100
13.2	14.5	14.5	3.1	96.9	90 - 100
9.5	65.2	79.7	17.1	82.9	70 - 88
4.75	92.1	171.8	36.9	63.1	53 - 71
2.36	45.1	216.9	46.5	53.5	42 - 58
1.18	48.9	265.8	57.0	43.0	34 - 48
0.600	56	321.8	69.1	30.9	26 - 38
0.300	44.8	366.6	78.7	21.3	18 - 28
0.150	37.1	403.7	86.6	13.4	12 - 20
0.075	31.6	435.3	93.4	6.6	4 - 10

Note:

- This test report should not be reproduced except in full, without written approval of the laboratory.
- The results indicated above are based on the tests carried out on the samples collected at the site.
- Any Query regarding the report must be reported within 30 days from the date of testing.

ಅಧಿಕೃತ ಕಾರ್ಯನಿರ್ವಾಹಕ ಅಧಿಕಾರಿ
M/S. CIVIL AIM CONSULTANTS & ENGINEERS
ಬೆಂಗಳೂರು. 29.07.2022
Authorised Signatory

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